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## Test 1264: John Deere 4640 Diesel

Tractor Museum

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# NEBRASKA TRACTOR TEST 1264 — JOHN DEERE 4640 DIESEL

## POWER TAKE-OFF PERFORMANCE

| Power<br>Hp<br>(kW)                              | Crank<br>shaft<br>speed<br>rpm | Fuel Consumption   |                       | Temperature °F (°C)   |                   |                    | Barometer<br>inch Hg<br>(kPa) |                    |
|--|--------------------------------|--------------------|-----------------------|-----------------------|-------------------|--------------------|-------------------------------|--------------------|
|  |                                | gal/hr<br>(l/h)    | lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | Cooling<br>medium | Air<br>wet<br>bulb |                               | Air<br>dry<br>bulb |
| MAXIMUM POWER AND FUEL CONSUMPTION               |                                |                    |                       |                       |                   |                    |                               |                    |
| Rated Engine Speed—Two Hours (PTO Speed—998 rpm) |                                |                    |                       |                       |                   |                    |                               |                    |
| 156.30<br>(116.55)                               | 2200                           | 10.011<br>(37.895) | 0.446<br>(0.271)      | 15.61<br>(3.076)      | 184<br>(84.3)     | 62<br>(16.8)       | 75<br>(24.0)                  | 28.760<br>(97.118) |

|   |             |                                 |                                |                                |                             |                            |                            |                                  |
|---|-------------|---------------------------------|--------------------------------|--------------------------------|-----------------------------|----------------------------|----------------------------|----------------------------------|
| <b>VARYING POWER AND FUEL CONSUMPTION—Two Hours</b> |             |                                 |                                |                                |                             |                            |                            |                                  |
| 136.42<br>(101.73)                                  | 2264        | 9.238<br>(34.969)               | 0.472<br>(0.287)               | 14.77<br>(2.909)               | 180<br>(82.2)               | 62<br>(16.7)               | 75<br>(23.9)               | .....                            |
| 0.00<br>(0.00)                                      | 2356        | 3.092<br>(11.705)               | .....                          | .....                          | 168<br>(75.6)               | 62<br>(16.7)               | 75<br>(23.9)               | .....                            |
| 69.55<br>(51.86)                                    | 2308        | 6.146<br>(23.263)               | 0.616<br>(0.374)               | 11.32<br>(2.229)               | 176<br>(80.0)               | 62<br>(16.7)               | 75<br>(23.9)               | .....                            |
| 156.00<br>(116.33)                                  | 2200        | 10.026<br>(37.952)              | 0.448<br>(0.272)               | 15.56<br>(3.065)               | 184<br>(84.4)               | 62<br>(16.7)               | 74<br>(23.6)               | .....                            |
| 35.53<br>(26.50)                                    | 2328        | 4.582<br>(17.346)               | 0.898<br>(0.546)               | 7.76<br>(1.528)                | 170<br>(76.7)               | 62<br>(16.7)               | 75<br>(23.9)               | .....                            |
| 103.70<br>(77.33)                                   | 2292        | 7.687<br>(29.100)               | 0.516<br>(0.314)               | 13.49<br>(2.657)               | 178<br>(81.1)               | 62<br>(16.7)               | 74<br>(23.6)               | .....                            |
| <b>Av 83.53</b><br><b>Av (62.29)</b>                | <b>2291</b> | <b>6.795</b><br><b>(25.722)</b> | <b>0.567</b><br><b>(0.345)</b> | <b>12.29</b><br><b>(2.422)</b> | <b>176</b><br><b>(80.0)</b> | <b>62</b><br><b>(16.7)</b> | <b>75</b><br><b>(23.8)</b> | <b>28.720</b><br><b>(96.983)</b> |

## DRAWBAR PERFORMANCE

| Power<br>Hp<br>(kW)  | Drawbar<br>pull<br>lbs<br>(kN) | Speed<br>mph<br>(km/h) | Crank-<br>shaft<br>speed<br>rpm | Slip<br>% | Fuel Consumption  |                       |                       | Temp. °F (°C)       |                    |                    | Barom.<br>inch Hg<br>(kPa) |
|--|--------------------------------|------------------------|---------------------------------|-----------|-------------------|-----------------------|-----------------------|---------------------|--------------------|--------------------|----------------------------|
|  |                                |                        |                                 |           | gal/hr<br>(l/h)   | lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | Cool-<br>ing<br>med | Air<br>wet<br>bulb | Air<br>dry<br>bulb |                            |
| Maximum Available Power—Two Hours 7th (B-2) Gear             |                                |                        |                                 |           |                   |                       |                       |                     |                    |                    |                            |
| 130.33<br>(97.19)  | 8994<br>(40.01)                | 5.43<br>(8.75)         | 2199                            | 5.84      | 9.798<br>(37.088) | 0.524<br>(0.318)      | 13.30<br>(2.621)      | 179<br>(81.4)       | 42<br>(5.6)        | 52<br>(11.1)       | 28.660<br>(96.781)         |
| 75% of Pull at Maximum Power—Ten Hours 7th (B-2) Gear        |                                |                        |                                 |           |                   |                       |                       |                     |                    |                    |                            |
| 106.58<br>(79.47)  | 6960<br>(30.96)                | 5.74<br>(9.24)         | 2291                            | 4.65      | 8.771<br>(33.202) | 0.573<br>(0.349)      | 12.15<br>(2.394)      | 173<br>(78.3)       | 33<br>(0.4)        | 38<br>(3.6)        | 29.295<br>(98.925)         |
| 50% of Pull at Maximum Power—Two Hours 7th (B-2) Gear        |                                |                        |                                 |           |                   |                       |                       |                     |                    |                    |                            |
| 72.56<br>(54.11)   | 4617<br>(20.54)                | 5.89<br>(9.48)         | 2323                            | 3.38      | 7.034<br>(26.627) | 0.675<br>(0.411)      | 10.32<br>(2.032)      | 172<br>(77.8)       | 56<br>(13.3)       | 57<br>(13.9)       | 28.460<br>(96.105)         |
| 50% of Pull at Reduced Engine Speed—Two Hours 9th (B-3) Gear |                                |                        |                                 |           |                   |                       |                       |                     |                    |                    |                            |
| 72.86<br>(54.34)   | 4626<br>(20.58)                | 5.91<br>(9.51)         | 1634                            | 3.38      | 5.419<br>(20.514) | 0.518<br>(0.315)      | 13.45<br>(2.649)      | 173<br>(78.1)       | 52<br>(11.1)       | 53<br>(11.7)       | 28.445<br>(96.054)         |

## MAXIMUM POWER IN SELECTED GEARS

|                    |                  |                 |      |       |                |  |  |               |              |              |                    |
|--------------------|------------------|-----------------|------|-------|----------------|--|--|---------------|--------------|--------------|--------------------|
| 94.28<br>(70.30)   | 15362<br>(68.33) | 2.30<br>(3.70)  | 2300 | 14.81 | 2nd (A-2) Gear |  |  | 173<br>(78.3) | 22<br>(-5.5) | 24<br>(-4.3) | 29.350<br>(99.111) |
| 130.44<br>(97.27)  | 11670<br>(51.91) | 4.19<br>(6.75)  | 2200 | 7.84  | 4th (B-1) Gear |  |  | 179<br>(81.4) | 43<br>(6.1)  | 52<br>(11.1) | 28.640<br>(96.713) |
| 131.18<br>(97.82)  | 9830<br>(43.73)  | 5.00<br>(8.05)  | 2199 | 6.39  | 6th (C-1) Gear |  |  | 180<br>(82.2) | 43<br>(6.1)  | 52<br>(11.1) | 28.640<br>(96.713) |
| 133.94<br>(99.88)  | 9229<br>(41.05)  | 5.44<br>(8.76)  | 2202 | 5.76  | 7th (B-2) Gear |  |  | 181<br>(82.5) | 46<br>(7.8)  | 54<br>(12.2) | 28.640<br>(96.713) |
| 134.70<br>(100.45) | 7828<br>(34.82)  | 6.45<br>(10.38) | 2199 | 4.81  | 8th (C-2) Gear |  |  | 179<br>(81.7) | 43<br>(6.1)  | 52<br>(11.1) | 28.640<br>(96.713) |
| 133.25<br>(99.37)  | 6332<br>(28.16)  | 7.89<br>(12.70) | 2198 | 3.91  | 9th (B-3) Gear |  |  | 179<br>(81.7) | 43<br>(6.1)  | 52<br>(11.1) | 28.640<br>(96.713) |

## LUGGING ABILITY IN RATED GEAR 7th (B-2)

|                      |  |                   |                    |                   |                   |                   |                  |
|----------------------|--|-------------------|--------------------|-------------------|-------------------|-------------------|------------------|
| Crankshaft Speed rpm |  | 2202              | 1982               | 1763              | 1544              | 1313              | 1095             |
| Pull—lbs<br>(kN)     |  | 9229<br>(41.05)   | 10389<br>(46.21)   | 11192<br>(49.79)  | 11897<br>(52.92)  | 12256<br>(54.52)  | 10640<br>(47.33) |
| Increase in Pull %   |  | 0                 | 13                 | 21                | 29                | 33                | 15               |
| Power—Hp<br>(kW)     |  | 133.94<br>(99.88) | 134.64<br>(100.40) | 127.80<br>(95.30) | 118.36<br>(88.26) | 102.95<br>(76.77) | 75.81<br>(56.53) |
| Speed—Mph<br>(km/h)  |  | 5.44<br>(8.76)    | 4.86<br>(7.82)     | 4.28<br>(6.89)    | 3.73<br>(6.00)    | 3.15<br>(5.07)    | 2.67<br>(4.30)   |
| Slip %               |  | 5.76              | 6.70               | 7.31              | 8.07              | 8.52              | 7.01             |

## Department of Agricultural Engineering

**Dates of Test:** November 2 to 21, 1977

**Manufacturer:** JOHN DEERE WATERLOO TRACTOR WORKS, P.O. Box 270, Waterloo, Iowa 50704

**FUEL, OIL AND TIME:** Fuel No. 2 Diesel Cetane No. 50.8 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60° (15°/15°)** 0.8366 **Fuel weight** 6.966 lbs/gal (0.837 kg/l) **Oil SAE 30 API service classification** CD, CC and SD **To motor** 4.858 gal (18.390 l) **Drained from motor** 4.295 gal (16.258 l) **Transmission and final drive lubricant** John Deere Hy-Gard Transmission and Hydraulic Oil **Total time engine was operated** 45 hours

**ENGINE Make** John Deere Diesel **Type** 6 cylinder vertical with turbocharger and intercooler **Serial No.** 6466AR-07-024419RG **Crankshaft lengthwise** **Rated rpm** 2200 **Bore and stroke** 4.5625" × 4.75" (115.9 mm × 120.7 mm) **Compression ratio** 15.5 to 1 **Displacement** 466 cu in (7636 ml) **Cranking system** 12 volt **Lubrication pressure** **Air cleaner** paper primary and safety elements with dust evacuator **Oil filter** one screw-on cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for transmission and hydraulic oil **Fuel filter** two snap-on paper cartridges **Muffler** vertical **Cooling medium temperature control** 2 thermostats.

**CHASSIS:** **Type** standard with duals **Serial No.** 4640H 001412R **Tread width** rear 60" (1524 mm) to 131.6" (3342 mm) front 59.5" (1511 mm) to 95.6" (2428 mm) **Wheel base** 118.5" (3009 mm) **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 34.8" (885 mm) Vertical distance above roadway 43.5" (1106 mm) Horizontal distance from center of rear wheel tread 0.23" (6 mm) to the right **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled power shift **Advised speeds mph (km/h)** first 2.0 (3.2) second 2.6 (4.1) third 3.6 (5.8) fourth 4.5 (7.2) fifth 4.6 (7.4) sixth 5.3 (8.5) seventh 5.7 (9.2) eighth 6.7 (10.8) ninth 8.1 (13.0) tenth 8.5 (13.7) eleventh 9.5 (15.3) twelfth 10.3 (16.6) thirteenth 10.9 (17.5) fourteenth 12.1 (19.5) fifteenth 15.4 (24.8) sixteenth 19.6 (31.6) reverse 3.8 (6.1), 4.8 (7.7), 8.5 (13.6), 9.9 (16.0), 10.8 (17.3), 12.6 (20.3) **Clutch** multiple wet disc hydraulically power actuated and operated by foot pedal **Brakes** wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 161" (4.09 m) left 161" (4.09 m) (on concrete surface without brake) right 182" (4.62 m) left 182" (4.62 m) **Turning space diameter** (on concrete surface with brake applied) right 336" (8.53 m) left 336" (8.53 m) (on concrete surface without brake) right 377" (9.58 m) left 377" (9.58 m) **Power take-off** 998 rpm at 2200 engine rpm.

| TRACTOR SOUND LEVEL WITH CAB                  |                   | dB(A)                      |
|---|-------------------|----------------------------|
| Maximum Available Power—Two Hours             |                   | 77.5                       |
| 75% of Pull at Maximum Power—Ten Hours        |                   | 77.5                       |
| 50% of Pull at Maximum Power—Two Hours        |                   | 77.5                       |
| 50% of Pull at Reduced Engine Speed—Two Hours |                   | 77.0                       |
| Bystander in 16th (D-4) gear                  |                   | 88.0                       |
| <b>TIRES, BALLAST AND WEIGHT</b>              |                   |                            |
| <b>Rear Tires</b>                             |                   | <b>Without Ballast</b>     |
| —No., size, ply & psi ( <i>kPa</i> )          |                   | Four 18.4-42; 10; 14 (100) |
| Ballast                                       | —Liquid (each)    | None                       |
|   | —Cast Iron (each) | None                       |
| <b>Front Tires</b>                            |                   |                            |
| —No., size, ply & psi ( <i>kPa</i> )          |                   | Two 14L-16.1; 6; 28 (190)  |
| Ballast                                       | —Liquid (each)    | None                       |
|   | —Cast Iron (each) | None                       |
| <b>Height of drawbar</b>                      |                   | 24 in (610 mm)             |
| <b>Static weight with operator</b> —rear      |                   | 13555 lb (6148 kg)         |
|   | front             | 4565 lb (2071 kg)          |
|   | total             | 18120 lb (8219 kg)         |

**REPAIRS and ADJUSTMENTS:** No repairs or adjustments.

**REMARKS:** All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 153°F (67.4°C). Six gears were chosen between 15% slip and 15 mph (24.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1264**.

LOUIS I. LEVITICUS

Engineer-in Charge

G. W. STEINBRUEGGE, Chairman

W. E. SPLINTER

K. VON BARGEN

Board of Tractor Test Engineers



**John Deere 4640 Diesel**